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NEW NORTH AMERICAN PHILANTHUS

(HYMENOPTERA: SPHECIDAE)

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ABSTRACT—Five new species of *Philanthus* are described: **arizonicus** from Arizona, **levini** and **nasalis** from California, **michelbacheri** from Baja California, and **schusteri** from southern California and Arizona.

During preparation of a treatise on *Philanthus* of California, several unnamed species were found and these are described below. Types are placed in the Entomology Museum at the University of California, Davis, except for *P. michelbacheri* which will go to the California Academy of Sciences. Paratypes have been distributed to various museums but particularly the following: California Insect Survey, University of California, Berkeley; University of California, Riverside, Los Angeles County Museum; Arizona State University, Tempe; University of Idaho, Moscow; and U. S. National Museum.

Philanthus arizonicus R. Bohart, n. sp.

Male. Length 11.5 mm, forewing 9.0 mm. Black, marked with yellow as follows: mandible mostly, clypeus and most of frons below midocellus (fig. 1), a pair of postocellar dots, 4 large postocular spots, pronotal ridge, pronotal lobe and associated mesopleural spot, other mesopleural dots, lateral scutal spots, scutellum centrally, band across metanotum, lateral propodeal spot, coxal spots, femora distally, tibiae and tarsi mostly, broad band across middle of tergum I, other terga almost wholly, sterna I-VI extensively; clypeal brush tawny; wing veins and stigma red as well as spots on malar space, vertex, scape, pedicel, flagellomere I entirely, coxae and femora mostly, trochanters and tibiae partly, sterna I-II partly, other sterna slightly; wing membrane extensively dusky. Pubescence whitish to pale yellowish. Setigerous punctures of clypeus separated by 1 to 2 puncture diameters, becoming sparse near top margin, polished between; upper

frons not substriate, punctures 1 to 2 diameters apart; vertex and scutum with moderately small and irregularly spaced punctures, leaving large polished areas; mesopleural punctures moderate-sized, about a diameter apart, propodeum similar but punctation closer on some areas, enclosure with posterior smooth spot; tergum I with small to medium punctures, contiguous to 2 diameters apart; tergum II similar but punctures 1 to 2 diameters apart, terga III-IV with well spaced punctures smaller than those on scutum; other terga with fine, well spaced punctures. Malar space at middle 2.1 times length of pedicel; clypeal brushes touching at middle of clypeal rim; least interocular distance $\frac{7}{8}$ clypeal breadth; ocellocular distance 3.0 lateral ocellus diameters; pronotal ridge moderately thin and smoothly rounded.

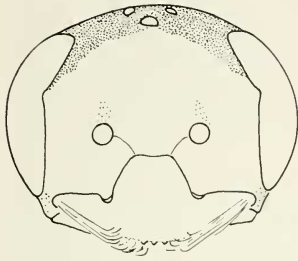
Holotype male (UCD), 18 mi. s. Gila Bend, Maricopa Co., Arizona, May 8, 1965, on *Prosopis juliflora* (M. A. Mortensen *et al.*). Paratype male (Ariz. State Univ.), same data as holotype.

This species is related to *multimaculatus* Cameron and agrees with it in having (1) the punctation of tergum III not coarser than that of the scutum; (2) the malar space in the male relatively long; and (3) the scutal punctures very unevenly distributed. However, *arizonicus* is a larger species, more extensively red, and the ocellocular distance is about three lateral ocellus diameters rather than two (fig. 1).

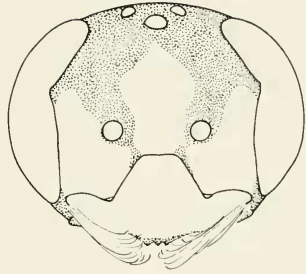
Philanthus levini R. Bohart, n. sp.

Male. Length 9 mm, forewing 7 mm. Black, marked with sulfur yellow as follows: clypeus and lower frons except for antennal emarginations, central yellow area pointed above and nearly reaching midocellus (fig. 2), scape and flagellomeres I-II within, postocular spot, pronotal ridge, pronotal lobe, associated mesopleural spot, 2 other mesopleural dots, tegula, a pair of dots on scutellum, band across metanotum, coxal spots, femora distally, tibiae and tarsi mostly, bands across terga, that on I broken medially, on II with deep anteromedial emargination, III and following somewhat bi-emarginate anteriorly, broad bands across sterna II-IV; clypeal brush tawny, wing veins and stigma reddish, wing membrane nearly clear, a little stained toward apex. Pubescence white to faintly fulvous, mostly sparse. Setigerous punctures on clypeus well spaced, polished between, upper frons becoming closely punctate and substriate, vertex and notum polished with fine sparse punctures, mesopleuron similar, terga with small to moderate well spaced and shallow punctures, those of I-III much larger than on scutum. Malar space at middle 1.2 times length of pedicel; clypeal brushes touching medially; least interocular distance about $\frac{5}{8}$ clypeal breadth, ocellocular distance 2 lateral ocellus diameters, pronotal ridge narrowly but smoothly rounded.

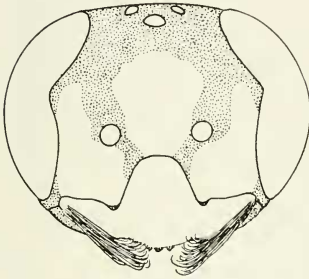
Female. Length 11.0-12.5 mm. Markings, pubescence and punctation about as in male except as follows: mandible extensively yellow, flagellomere II dark, propodeum often with spots, body venter more extensively yellow, all terga sometimes with complete yellow bands, wing membrane dusky. Clypeal apex projecting and somewhat up-tilted, width slightly more than that of pedicel; lines drawn from apex of angle of eye emargination to outer edge of clypeus essentially parallel; flagellomere I about 2.2 times as long as broad; front basitarsus with 3 well developed setae before apex.



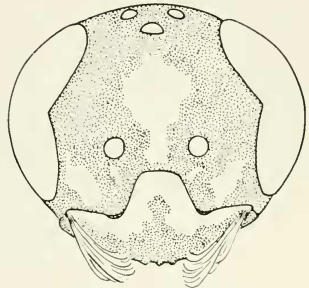
1. *arizonicus*



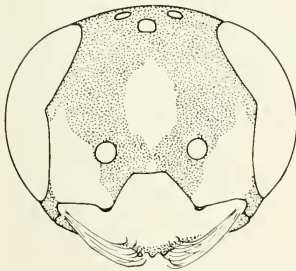
2. *levini*



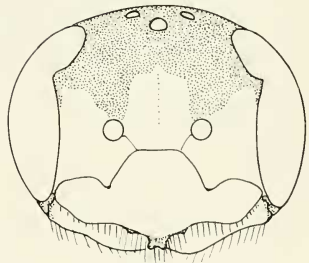
3. *michelbacheri*



4. *schusteri*



5. *nasalis*



6. *nasalis*

Figs. 1-6. Facial views of *Philanthus*: 1-5, male holotype; 6, female paratype.

Holotype male (UCD), dry wash, 3 miles sw. of Pearblossom, Los Angeles Co., California, 3500 ft. elev., September 28, 1970, on *Lepidospartum squamatum* (D. P. Levin). Paratypes, 33 males, 2 females, same data as holotype except some collected October 14-16, 1970 (C. Henne). Other paratypes, California, 21 males, 12 females, Ventura Co.: 22 mi. nw. Ojai (J. Powell); Los Angeles Co.: Big Rock Creek (R. Snelling), Little Rock (A. Hardy), Palmdale; Riverside Co.: Coahuila Creek (T. Craig), Whitewater Canyon (P. Timberlake); San Bernardino Co.: 5 mi. se. Pinon Hills (R. Rude), Cajon Canyon (E. Schlinger, A. Melander, P. Timberlake), Deep Creek (P. Timberlake), Morongo Valley (P. Timberlake). Paratypes were collected from August 21 to October 16. A single female (Palmdale) was taken on June 14.

P. levini is a member of the *pacificus* Cresson group which is characterized by having the pale band of terga IV and/or V anteriorly bi-emarginate. Within this group it is distinguished in the male by having (1) the punctation of tergum III more coarse than that of the scutum, (2) the scutal punctures very unevenly spaced, and (3) by having both terga and sterna with yellow bands. The female has the punctation of the scutum quite irregular and finer than that on tergum II, the mesopleuron is spotted, the propodeal enclosure is not ridged, the tergal punctation is unusually shallow, and the markings are yellow. The species is named for D. P. Levin who collected much of the type series.

***Philanthus michelbacheri* R. Bohart, n. sp.**

Male. Length 10 mm, forewing 8 mm. Black, marked with whitish to whitish yellow as follows: clypeus and lower two thirds of frons except for antennal emarginations which reach clypeus (fig. 3), mandible mostly, dots on scape and flagellomere II, postocular spot, pronotal ridge, pronotal lobe and 2 following spots on mesopleuron, tegula, dots on scutellum, band across metanotum, large lateral propodeal spot, small coxal spots, femora distally, tibiae and tarsi mostly, large separated spots on terga I-II, those of II emarginate posteriorly, broadly concave apical band on III, anteriorly bi-emarginate bands on IV-VI, large lateral spots on sterna II-III, small ones on IV-V, clypeal brush blackish; costa pale near base, other wing veins and stigma reddish, wing membrane a little stained near apex. Pubescence whitish. Setigerous punctures on clypeus sparse, polished between; upper frons closely punctate and substriate; punctures moderately small and averaging a little more or less than a diameter apart on vertex, scutum, mesopleuron, and terga I-II, close over most of propodeal enclosure (which is polished laterally), punctures progressively finer on terga III-VI, punctation of tergum II about as coarse as on scutum. Malar space at middle 1.2 times length of pedicel; clypeal brushes occupying $\frac{7}{8}$ of apical clypeal rim; least interocular distance $\frac{5}{6}$ clypeal breadth; ocellular distance 2.0 lateral ocellus diameters; pronotal ridge moderately thin and smoothly rounded.

Female. Length 13 mm. Markings, pubescence and punctation about as in

male except as follows: markings yellow, anterior and posterior lateral scutal spots, mesopleuron and thoracic venter extensively yellow, a complete but posteriorly bi-emarginate band on tergum II, those on III and following with broadly concave anterior margins, sterna II-V with broad yellow bands. Clypeal apex projecting slightly, width about 1.6 times that of pedicel; lines drawn from apex of angle of eye emargination to outer edge of clypeus essentially parallel; flagellomere I nearly 3 times as long as broad; front basitarsus with 3 fully developed setae before apex.

Holotype male (CAS), Rancho Santa Margarita, 28 miles s. El Arco, Baja California, Mexico, July 3, 1960 (A. E. Michelbacher). Paratypes, 24 males, 1 female, same data as holotype. Other paratypes, Baja California: 1 male, Boca de Santa Maria, August 12, 1954 (J. Powell); 1 male, Colonia Guerrero, August 13, 1954 (J. Powell); 1 female, Santa Maria Valley, August 11, 1954 (J. Powell); 1 female, Las Animas Bay, May 8, 1921 (E. P. Van Duzee).

P. michelbacheri is one of the few North American species in which the male clypeal brush is black (fig. 3). Others are *crotoniphilus* Viereck and Cockerell, *gibbosus* (Fabricius), *barbatus* F. Smith, *banabacoa* Alayo, and some *neomexicanus* Strandtmann. From all of these except the last, *michelbacheri* differs by having the punctuation of tergum III not more coarse than that on the scutum. The rather short malar space in *michelbacheri* is a separational feature in the male (fig. 3). In the female the punctuation of tergum II is more coarse than that of the scutum. Also, the costa is pale toward the base rather than rust-red as in *neomexicanus*. The species is named for A. E. Michelbacher, who has collected extensively in the Hymenoptera.

Philanthus nasalis R. Bohart, n. sp.

Male. Length 8.0 mm, forewing 6.5 mm. Black, marked with ivory white as follows: clypeus, adjacent large triangular lateral frontal spot, interantennal dot below large oval frontal spot which is pointed above and below (fig. 5), postocular spot, inner side of flagellomeres I-III, spot on scape, pronotal ridge, apex of pronotal lobe, adjacent mesopleural spot, tegula, forewing costa extensively, other wing veins toward base, metanotal band, femora distally, tibiae and tarsi mostly, latter darkened distally, large lateral spots on terga I-II, a pair of apicomедial spots on II, narrow and bilaterally emarginate apical bands on terga III-V, a pair of dots on VI, lateral dots on sterna III-IV; clypeal brush pale tawny; wing membrane nearly clear, stigma light brown. Pubescence whitish, mostly sparse. Setigerous punctures on clypeus sparse, polished between; upper frons closely punctate and substriate, a moderate shiny spot in front of midocellus, vertex and notum polished with small sparse punctures, mesopleuron similar but punctures a little larger, terga I-III polished with medium large but well separated punctures, those of IV-VI progressively smaller. Malar space at middle 1.6 times length of pedicel; clypeal brushes practically touching medially; least interocular distance about $\frac{2}{3}$ clypeal breadth; ocellocular distance 2 lateral ocellus diameters; pronotal ridge narrowly but smoothly rounded.

Female. Length 11.5 mm. Markings, pubescence and punctuation about as in male except as follows: mandible mostly pale, flagellomere II unspotted, flagellum dull red beneath, lower frons all whitish except for antennal emarginations (fig. 6), wing veins and tarsi reddish brown, tergum V with a deeply bi-emarginate pale band. Clypeal apex strongly projecting forward and upturned (fig. 6), width of apex about equal to that of pedicel, lines drawn from apex of angle of eye emargination to outer edge of clypeus essentially parallel; flagellomere I about 2.5 times as long as broad; front basitarsus with 3 well developed setae before apex.

Holotype male (UCD), Antioch, Contra Costa Co., California, October 14, 1954 (M. Wasbauer). Paratypes, 4 males, 15 females, Antioch, California, September 25 to October 25, on *Eriogonum* (P. D. Hurd, A. M. Barnes, G. I. Stage, M. Wasbauer, E. E. Lindquist, D. Burdick).

***Philanthus schusteri* R. Bohart, n. sp.**

Male. Length 8.0 mm, forewing 6.5 mm. Black, marked with ivory white as follows: undulating basal band on clypeus, irregular lower frontal spots, irregular and somewhat longitudinal upper frontal spot (fig. 4), inner surface of flagellomeres II-III and apex of I, pronotal ridge except narrowly at middle, dot on pronotal lobe, tegula, dot on metanotum, costa basally, extreme distal end of femora, outer surface of tibiae, complete irregular bands across terga I-II, 3 apical spots on III, bi-emarginate apical bands on IV-V, lateral dots on sterna III-IV; clypeal brush off-white; wing membrane clear, stigma light reddish; flagellum fulvous beneath beyond flagellomere I; tarsi reddish, as well as insides of tibiae and apex of hind femur. Pubescence whitish, mostly sparse. Setigerous punctures on clypeus sparse, polished between; upper frons and vertex with sparse fine punctures; scutum and mesopleuron with small but rather well spaced punctures, fewer on scutellum and more irregular on propodeal enclosure; terga with small and well spaced punctures which become progressively finer posteriorly. Malar space at middle 1.6 times length of pedicel; clypeal brushes nearly touching medially; least interocular distance about $\frac{5}{6}$, clypeal breadth; ocellular distance 1.8 lateral ocellus diameters; pronotal ridge forming a thin, slightly rounded edge.

Female. Length 9.5 mm. Markings, pubescence and punctuation about as in male except as follows: mandible mostly pale, scape and flagellomere I whitish inside, flagellum extensively light reddish beneath, clypeus and lower frons pale except for antennal emarginations, postocular spot present, metanotum banded, femora mostly red, tergum I with 3 whitish spots, II-V with bi-emarginate bands which on II may tend to enclose a pair of black spots, sterna II-V with variable whitish markings. Clypeal apex not unusually projecting, width about twice that of pedicel; lines drawn from apex of angle of eye emargination to outer edge of clypeus essentially parallel; flagellomere I about twice as long as broad. Front basitarsus with 3 well developed setae before apex.

Holotype male (UCD), Palo Verde, Imperial Co., California, April 3, 1966 (R. O. Schuster). Paratypes, California, 4 males, 28 females, Imperial Co.: Palo Verde (R. Schuster, R. Bohart, P. Hurd, D. Bright); Riverside Co.: 18 mi. w. Blythe (R. Schuster, R. Bohart, J. Hall, P. Timberlake, R. Brumley, C. Kovacic); Hopkins Well (E. Linsley, P.

Hurd); San Bernardino Co.: Carsons Well (R. Bohart). Other paratypes, 1 male, 15 females, Arizona: 12 mi. n. Quartzite (S. Davidson, M. Cazier), Ligurta (F. Parker, J. Davidson, M. Cazier), 18 mi. s. Gila Bend (J. Davidson, M. Cazier, S. Gorodenski), San Luis (J. Davidson, M. Cazier). Dates of collection were from March 22 to April 23.

P. schusteri is the only member of the *pacificus* group in which the mesopleuron is all dark. Also, the femora are partly reddish and the forewing costa is whitish toward the base. Together with the fine scutal punctation, these characters will separate it from all other North American *Philanthus*. Facial markings in the male (fig. 4) are variable but the lower frons is unusually dark and there is always a large black apical spot on the clypeus. The species is named for R. O. Schuster who collected much of the type series.

**A PRELIMINARY KEY TO THE SPECIES OF THE NEOTROPICAL
GENUS TETREUARESTA HENDEL**
(DIPTERA: TEPHRITIDAE)

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ABSTRACT—The 17 known species of *Tetreuaresta* are keyed, including 8 species for the first time.

The genus *Tetreuaresta* was established by Hendel in 1928, as a segregate of *Euaresta* Loew and distinguished by the following characters: 3 pairs of lower fronto-orbital bristles; 2 pairs of scutellars; 3rd vein with setae on nearly entire length; dark brown background color of wing even, not mottled, hyaline spots discrete. As shown by Foote (1967: 4), the genus is one of 16 genera left by Aczél in a residual group of Tephritini, the generic limits of which are still in need of study. The catalogue of neotropical Tephritidae (Foote, 1967: 43) lists 17 species of *Tetreuaresta*. In Hendel's monograph of South American Tephritidae (1914: 70) nine of those species are keyed under *Euaresta*, and Hering (1941: 154) gave a key to five of those nine that were known to occur in Peru. It is hoped that the key here

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